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Listing of Claims

1. (Currently Amended) A method of tomographic imaging, and particularly a CT or MR method, for repetitively producing diagnostic slice images of a part of a patient's body, having the following method steps:

- a) making of current reference slice images ~~(1)~~ of the part of the body,
- b) determination of a geometrical transformation ~~(2)~~ by which the current reference slice images ~~(1)~~ are brought into agreement with earlier reference slice images ~~(3)~~ of the part of the body,
- c) calculation of current imaging parameters ~~(5)~~ by transforming earlier imaging parameters by means of the geometrical transformation ~~(2)~~ determined in step b),
- d) making of a current diagnostic slice image ~~(6)~~, the position and orientation in three dimensions of the image plane of the diagnostic slice image ~~(6)~~ being determined by the current imaging parameters ~~(5)~~ calculated in step c),

~~characterized in that~~ wherein there are made in step a) of the method at least two current reference slice images ~~(1, 1')~~ whose image planes are preset in such a way that their relative positions and orientations ~~(7)~~ in three dimensions agree with the relative positions and orientations ~~(8)~~ in three dimensions of the earlier reference slice images ~~(3, 3')~~, and in that the geometrical transformation ~~(2)~~ is determined in step b) in such a way that, by it, all the current reference slice images are brought into agreement with the corresponding earlier reference slice images simultaneously.

2. (Currently Amended) A method as claimed in claim 1, ~~characterized in that~~ wherein the geometrical transformation ~~(2)~~ is determined in step b) of the method by identifying reference points in the current reference slice images ~~(1, 1')~~ that agree with corresponding reference points in the earlier reference slice images ~~(3, 3')~~.

3. (Currently Amended) A method as claimed in claim 1, ~~characterized in that~~ wherein the geometrical transformation ~~(2)~~ determined in step b) of the method is a rigid or an affine transformation that is defined by a set ~~(4)~~ of transformation parameters, the set ~~(4)~~ of transformation parameters being determined automatically by, by means of a suitable algorithm, optimizing a measure of similarity that represents the similarity of the current reference slice images ~~(1, 1')~~ to the corresponding earlier ones ~~(3, 3')~~.

4. (Currently Amended) A method as claimed in claim 1, ~~characterized in that~~wherein a plurality of parallel reference slice images (~~14, 15, 16~~) are made in each of the head-foot, anterior-posterior and right-left directions in step b) of the method, the image resolution being selected to be higher in the image planes than perpendicularly thereto.

5. (Currently Amended) A computer program for performing the method claimed in claim 1, which automatically determines imaging parameters by which the position and orientation in three dimensions of the image plane of a diagnostic slice image (~~6~~) are determined, so doing by

- a) receiving current image data for current reference slice images (~~1~~) and earlier image data for earlier reference slice images (~~3~~) as an input,
- b) determining a geometrical transformation (~~2~~) by which the current image data is brought into agreement with the earlier image data,
- c) calculating the current imaging parameters (~~5~~) by transforming earlier imaging parameters by the geometrical transformation (~~2~~) determined in step b),
~~characterized in that~~wherein the input in step a) comprises current and earlier image data for, in each case, at least two current (~~1, 1'~~) and earlier reference slice images (~~3, 3'~~), and in that, in step b), the geometrical transformation (~~2~~) brings the image data for all the current reference slice images (~~1, 1'~~) into agreement with the image data for the corresponding earlier reference slice images (~~3, 3'~~) simultaneously, a set (~~4~~) of transformation parameters defining the geometrical transformation being determined by, by means of a suitable optimizing algorithm, maximizing a measure of similarity that represents the similarity of the current image data to the corresponding earlier image data.

6. (Currently Amended) A tomographic imaging unit ~~(9)~~ having image-making means ~~(10)~~ that make diagnostic slice images ~~(6)~~, and having a computer ~~(11)~~ that operates the image-making means ~~(10)~~ and for this purpose calculates imaging parameters ~~(5)~~ that determine the particular positions and orientations in three dimensions of the image planes of the diagnostic slice images ~~(6)~~, characterized in that the computer ~~(11)~~ is so set up in respect of software that the making of the diagnostic slice images ~~(6)~~ takes place by the method claimed in claim 1.